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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/071,301	02/08/2002	Eiji Hamamoto	020588	1113

38834 7590 05/24/2005

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ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 05/24/2005

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/071,301
Filing Date: February 08, 2002
Appellant(s): HAMAMOTO ET AL.

Nicolas E. Seckel
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 03/18/05.

HC

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

US 3531351	BUZZELL	9-1970
US 4545648	SHULMAN	10-1985
US 3015989	DELANGRE	01-1962

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

A. Claims 1-5, 9-12, 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buzzell.

Regarding claims 1-4, 19-24, Buzzell teaches a process of producing a polarizing plate (composite light-polarizing material structure) (column 1, lines 10-20) comprising a polyvinyl alcohol-based polarizing film and a transparent protective film (transparent, cellulose acetate base) bonded to at least one surface of the polyvinyl alcohol-based polarizing film (laminated) (column 6, lines 10-15) (claims 1,4). The polyvinyl alcohol-based polarizing film contains a dichroic substance (dye) (column 1, lines 65-75) (claim 1). The polyvinyl alcohol polarizing film which contains the dye is modified to hold fast the dye (column 5, lines 55-65), hence the term "polyvinyl alcohol-based".

Buzzell teaches that the adhesive layer is a preferred solution of polyvinyl alcohol in water (column 6, lines 1-5) (claim 2). A (i) crosslinking agent such as boric acid, capable of crosslinking a vinyl alcohol-based polymer (reacting with the alcoholic hydroxyls of the polyvinyl alcohol) (column 5, lines 40-50) (claim 3) and (ii) a catalyst such as hydrochloric acid (HCl) (column 6, lines 1-5) (claims 19-24) are added to the polyvinyl alcohol. Said boric acid crosslinking agent is water-soluble as defined by Applicant's specification (original claim 3).

Although Buzzell fails to teach that the polyvinyl alcohol adhesive solution itself contains a crosslinking agent, Buzzell teaches that the crosslinking agent helps maintain the dimensional stability of the polyvinyl alcohol against ambient humidity (column 5, lines 25-30), aided by a catalyst such as hydrochloric acid (HCl) (column 6, lines 1-5). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated the water-soluble crosslinking agent and catalyst into the water solution of polyvinyl alcohol for the adhesive layer as well as water solution of polyvinyl alcohol for the polarizing layer, in order to maintain the dimensional stability of the entire polarizing plate laminate (claim 1), as taught by Buzzell.

Regarding claim 5, Buzzell teaches that the transparent protective film is a triacetyl cellulose (triacetate) (column 6, lines 10-15) and has a saponified (hydrolyzed) surface for ease of adhesion (capacity) (column 4, lines 65-70).

Regarding claims 9-10, Buzzell teaches approximately 1 wt % of the water-soluble crosslinking agent (6 cc of glyoxal crosslinking agent in 900 g water) (column 6,

lines 50-60) which is within the claimed range of at least 0.1 wt % (claim 9). Buzzell fails to teach that the adhesive solution contains a least 10 wt% of the water-soluble crosslinking agent. However, an increase in the concentration of polyvinyl alcohol (column 6, lines 50-55) would require a proportional increase in the concentration of water-soluble crosslinking agent. Hence the concentration of water-soluble crosslinking agent varies with the concentration of polyvinyl alcohol to be crosslinked. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided an adhesive solution of at least 10 wt % of the water-soluble crosslinking agent for a proportional concentration of polyvinyl alcohol, in order to obtain the desired crosslinking of the polyvinyl alcohol layer (claim 10).

Regarding claims 11-12, although Buzzell fails to disclose the thickness of the adhesive layer, Buzzell does teach that the adhesive layer is extremely thin (a distinct layer is not visible in the laminate) (column 4, lines 35-40) and therefore most certainly within the claimed range of at most 0.5 microns (claim 11). The claimed thickness of at least 0.02 microns is in the range of 10^{-6} inch, which is still superthin. Limitations relating to the size is not sufficient to patentably distinguish over the prior art. See MPEP 2144.04[R-1] IV.A. A thicker adhesive layer provides greater interlaminar adhesive strength. Therefore, although Buzzell fails to teach that the thickness of the adhesive layer is at least 0.02 microns, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided the adhesive layer of Buzzell with a thickness of at least 0.02 microns (equivalent to 10^{-6} inch) (claim 12),

which is still superthin, in order to provide a minimum threshold of interlaminar adhesion.

B. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buzzell as applied to claims 1-5, 9-12, 19-24 above, and further in view of Shulman et al. (previously cited US 4,545,648).

Buzzell has been discussed above and teaches that the crosslinking agent helps maintain the dimensional stability of the polyvinyl alcohol against ambient humidity (column 5, lines 25-30). Buzzell fails to teach an additional optical layer on the polarizing plate (claim 6), which is other than a polarizing layer, and can be a reflective layer (claim 7), used in a liquid crystal display (claim 8).

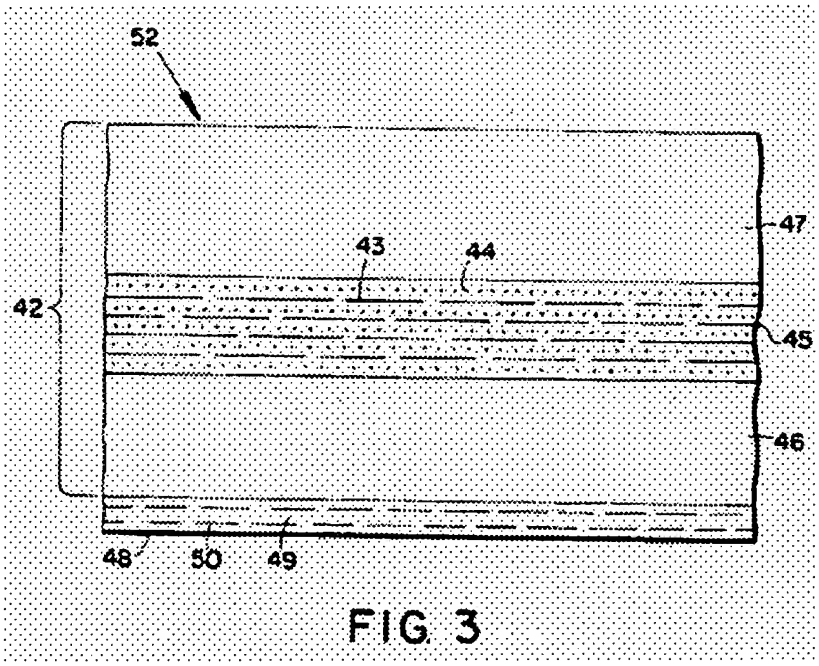

FIG 3

Shulman has a polarizer element in a liquid crystal display (column 4, lines 1-15) which comprises an additional optical layer which is semitransparent reflective (transflector layer 48) on a polarizing plate (polarizer element 42) comprising a polyvinyl

alcohol-based polarizing film 45 (containing an iodine-complex) and a transparent protective film bonded to at least one surface of the polyvinyl acohol-based polarizing film 42 (transparent isotropic cellulose acetate plastic sheets 46 and 47) (column 7, lines 20-30). See Fig. 3 of Shulman above. Water-soluble polyvinyl alcohol is the preferred adhesive (binder medium) (column 4, lines 35-40). Shulman fails to teach a crosslinking agent for the polyvinyl alcohol polymer.

Therefore it would have been obvious to one of ordinary skill in the art to have used the polarizing plate of Buzzell as the polarizing plate 42 of Shulman which comprises the reflective layer 48, in the liquid crystal display of Shulman, because the polarizing plate of Buzzell has greater dimensional stability against ambient humidity, as provided by the crosslinking of the polyvinyl alcohol polymer.

C. Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buzzell in view of Delangre et al. (previously cited US 3,015,989).

Regarding claims 13, 15-18, Buzzell teaches a process of producing a polarizing plate (composite light-polarizing material structure) (column 1, lines 10-20) comprising a polyvinyl alcohol-based polarizing film and a transparent protective film (transparent, cellulose acetate base) bonded to at least one surface of the polyvinyl alcohol-based polarizing film (laminated) (column 6, lines 10-15). Buzzell teaches the step of applying an adhesive layer (polyvinyl alcohol solution) (column 4, lines 60-65) to a polyvinyl alcohol-based polarizing film (molecularly oriented film 22) (column 4, lines 50-55) and a transparent protective film (cellulose acetate base) (column 4, lines 55-60), bonding the transparent protective film to the polarizing film.

Although Buzzell fails to teach that the polyvinyl alcohol adhesive solution itself contains a crosslinking agent, Buzzell teaches that the crosslinking agent helps maintain the dimensional stability of the polyvinyl alcohol against ambient humidity (column 5, lines 25-30), aided by a catalyst such as hydrochloric acid (HCl) (column 6, lines 1-5). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated the water-soluble crosslinking agent and catalyst into the water solution of polyvinyl alcohol for the adhesive layer as well as water solution of polyvinyl alcohol for the polarizing layer, in order to maintain the dimensional stability of the entire polarizing plate laminate, as taught by Buzzell.

Buzzell fails to disclose that the dichroic substance is added to the polarizing film prior to bonding it to the transparent protective film.

Delangre teaches a polarizing film (column 1, lines 10-15), wherein the dichroic substance (benzaldehyde-4-trimethyl ammonium iodide) is added to the polyvinyl alcohol (column 6, lines 65-70) during the process of formation of the polarizing film, demonstrating that it would have been an obvious process variation for one of ordinary skill in the art at the time the invention was made, to have added the dichroic substance to the polyvinyl alcohol during the step of forming and crosslinking the polyvinyl alcohol-based polarizing film in the process of Buzzell.

Regarding claim 14, Buzzell teaches that a polarizing plate is obtained (column 1, lines 10-20).

Regarding claim 15, Buzzell fails to teaches that the adhesive layer is applied to the polarizing film after it (the polarizing film) has been crosslinked and dried.

Delangre teaches that the polarizing film is dried and then laminated to the transparent protective film (base) (column 9, lines 14-21), demonstrating that it would have been an obvious process variation for one of ordinary skill in the art at the time the invention was made, to have applied the adhesive layer to the polarizing film of Buzzell after the polarizing film has been crosslinked and dried.

(10) Response to Arguments

A. Rejection of claims 1-5, 9-12, 19-24 under 35 U.S.C. 103(a) over Buzzell.

a. (i) Appellant argues that Buzzell teaches advantages of a crosslinking agent only with respect to its polyvinyl alcohol-based polarizing film, and is completely silent regarding whether adding a crosslinking agent and catalyst into the adhesive layer would improve the dimensional stability of the polarizing plate laminate.

Appellant is respectfully reminded that while Buzzell does not specify that adding a crosslinking agent and catalyst into the adhesive layer would improve the dimensional stability of the polarizing plate laminate, Buzzell teaches that the crosslinking agent helps maintain the dimensional stability of the polyvinyl alcohol polymer against ambient humidity (column 5, lines 25-30), aided by a catalyst such as hydrochloric acid (HCl) (column 6, lines 1-5). Buzzell specifies the polymer itself, meaning that any component made from the polymer with crosslinking agent and catalyst added, including the adhesive layer composed of the polymer (column 6, lines 1-10), and hence the polarizing plate laminate comprising the polarizer film and the adhesive layer, both composed of the polymer, would have the improved dimensional stability against

ambient humidity provided to the polymer via the crosslinking agent aided by the catalyst.

(ii) Appellant argues that Buzzell does not disclose the advantages of a crosslinking agent for any polymer, but only to the polymers used in the polarizing film, being very clear that the dimensional stability [imparted by the crosslinking agent] is a characteristic of the "mordanting" polarizer film, not the adhesive layer.

Appellant is respectfully apprised that if the adhesive providing interlaminar adhesion for a laminate is not dimensionally stable, the polarizing plate laminate is also not dimensionally stable. Therefore, because Buzzell teaches that the crosslinking agent helps maintain the dimensional stability of the polyvinyl alcohol polymer against ambient humidity (column 5, lines 25-30), it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have crosslinked the polyvinyl alcohol polymer in both the polarizing film as well as the adhesive layer, in order to provide dimensional stability of the laminate comprising the polyvinyl alcohol polymer.

b. Appellant argues that Buzzell is silent as to any possible function or advantage of a crosslinking agent in its adhesive, but also as to whether "dimensional stability" is desired by its adhesive layer.

Appellant is again respectfully apprised that if the adhesive providing interlaminar adhesion for a laminate is not dimensionally stable, the polarizing plate laminate is also not dimensionally stable. Buzzell emphasizes the desirability of the dimensional stability of the laminate by not just teaching the desirability of the dimensional stability of the polyvinyl alcohol polymer itself (column 5, lines 25-30), but also the desirability of

the dimensional stability of the transparent protective film (support) (column 3, lines 57-60). Therefore, because Buzzell emphasizes dimensional stability of the final polarizing plate laminate by teaching that the crosslinking agent helps maintain the dimensional stability of the polyvinyl alcohol polymer against ambient humidity and that the transparent protective film is dimensionally stable, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have crosslinked the polyvinyl alcohol polymer in both the polarizing film as well as the adhesive layer, in order to provide dimensional stability for the laminate comprising the polyvinyl alcohol polymer.

c. (i) Appellant argues that Buzzell is completely silent as to improving adhesiveness and prevention of peeling of its adhesive layer.

Appellant is respectfully reminded that the argument is moot since the features of adhesive strength and peel resistance of the adhesive layer are not present in the claims.

However, in order to help address the argument of unexpected results below, Appellant is respectfully reminded that Buzzell teaches that the adhesive provides a strong bond (column 3, lines 48-53), and that the final laminate is laminated with a bonding agent comprising adhesive, wherein the transparent protective film (base) is additionally treated to create an affinity for the polyvinyl alcohol layer (column 4, lines 60-65). Therefore Buzzell emphasizes the desirability of the strength of the adhesive bond, and the interlaminar adhesion of the final laminate.

(ii) Appellant argues that Appellant's specification provides evidence of unexpectedly improved resistance to peeling.

Appellant describes the effect of the crosslinked adhesive layer upon the dimensional stability of the laminate, making it hard to peel the layers of the laminate from each other under the influence of humidity and heat, as being an unexpected result (Specification, page 9, lines 30-35). Appellant is respectfully apprised that since Buzzell emphasizes dimensional stability of the final polarizing plate laminate by teaching that the crosslinking agent helps maintain the dimensional stability of the polyvinyl alcohol polymer against ambient humidity (column 5, lines 25-30), that the transparent protective film is dimensionally stable (column 3, lines 57-60), and that the adhesive provides a strong bond (column 3, lines 48-53), the result that the crosslinked adhesive layer provides improved resistance to peeling versus an adhesive layer which is not crosslinked, as presented by Applicant (Specification, page 9, lines 10-15, 20-30), is expected. Expected beneficial results are evidence of obviousness of a claimed invention. See MPEP 716.02(c)[R-2] II.

B. Rejection of claims 6-8 under 35 U.S.C. 103(a) over Buzzell in view of Shulman.

Appellant argues that Shulman fails to remedy the deficiencies of Buzzell as discussed above in Part A. The arguments regarding Buzzell have been addressed above.

It is noted that Appellant has not argued the validity of the combination of Buzzell in view of Shulman. The motivation to combine is proper as discussed in the section for the grounds of rejection above.

C. Rejection of claims 13-18 under 35 U.S.C. 103(a) over Buzzell in view of Delangre.

Appellant argues that Delangre fails to remedy the deficiencies of Buzzell as discussed above in Part A. The arguments regarding Buzzell have been addressed above.

It is noted that Appellant has not argued the validity of the combination of Buzzell in view of Delangre. The motivation to combine is proper as discussed in the section for the grounds of rejection above.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Sow-Fun Hon

Sow-Fun Hon

May 19, 2005

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